

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 2 and 12-14 are objected to because of the following informalities:

Claim 2, line 5, "the curvature radius of the formed arc" lacks antecedent basis.

Claim 12, line 1, change "a coating layer B" to --additional coating layer--.

Claim 13, line 2, change "coating layer B" to --additional coating layer--.

Claim 14, line 2, change "coating layer B" to --additional coating layer--.

Appropriate correction is required.

2. Claims 9 and 19 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend on another multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 7 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 03/081661 (see corresponding US 2004/0245320, Fukagaya et al.)

Fukagaya et al. discloses a bonding wire comprising a core and a coating layer formed on the core, wherein the coating layer is formed from a metal having a higher melting point than the core, and the wet contact angle with the coating layer when the core is melted is not smaller than 20 degrees (paragraph [0053]) (re claim 1). Fukagaya et al. also discloses the core material being composed mainly of copper ([0014]) (re claim 7) and the thickness of the coating layer falling within the range satisfying as  $0.007 \leq Y \leq 0.05$ , where  $Y = (\text{cross sectional area of coating layer} / \text{cross sectional area of core})$  in the cross section when the wire is cut vertically ([0095]) (re claim 17).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 2, 3 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al. (2002/0117330).

Eldridge et al. (Figures 2 and 4B) discloses a bonding wire comprising a core composed mainly of copper ([0312]) and a coating layer (134) formed on the core, wherein the coating layer is formed from an oxidation resistant metal having a higher melting point than the core ([0071]), and wherein the bonding wire is hung down with its end touching a horizontal surface.

Eldridge et al. does not disclose the wire being cut at a point 15 cm above the end nor the curvature radius of the formed arc being 35 mm or larger.

However, it would have been obvious to one skilled in the art to modify the

bonding wire of Eldridge et al. by choosing suitable distance to cut the wire above its end and by choosing suitable radius for the formed arc to meet the specific use of the resulting wire since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F. 2d 272, 205 USPQ 215.

Re claim 18, Eldridge et al. discloses the core wire being coated with two coating layers formed of different metals.

8. Claims 4, 5, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukagaya et al.

Fukagaya et al. discloses the invention substantially as claimed including the coating layer being formed from a metal whose melting point is at least 200°C higher than that of copper (copper = 1084°C, nickel= 1455°C) (re claim 8) and the core containing other elements than copper in a total amount not smaller than 0.001 pbw but not larger than 1 pbw relative to the weight of the core ([0044]) (re claim 10).

Fukugaya et al. does not disclose the 0.2% yield strength not smaller than 0.125 mN/ $\mu\text{m}^2$  but not greater than 0.155 mN/ $\mu\text{m}^2$  (re claims 4 and 5). However, it would have been obvious to one skilled in the art to choose suitable 0.2% yield

strength for the wire of Fukugaya et al. to meet the specific use of the resulting wire since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

9. Claims 6, 11, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyofuku et al. (JP 04-079243).

Toyofuku et al. discloses a bonding wire comprising a core (2) and a coating layer (1) formed on the core, wherein the coating layer is formed from a metal having a higher melting point than the core, wherein the core material is composed mainly of silver (see English abstract) (re claim 11) and the coating layer is formed from a metal composed mainly of palladium (re claims 15 and 16).

Toyofuku et al. does not disclose the Vickers hardness of the coating layer being 300 or lower (re claim 6). However, it would have been obvious to one skilled in the art to choose suitable Vickers hardness for the coating layer of Toyofuku et al. to meet the specific use of the resulting wire since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F. 2d 272, 205 USPQ 215.

10. Claims 12-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Toyofuku et al. in view of Chang (6,261,436).

Claims 12-14 additionally recite the wire being coated with an additional layer which is an outermost layer, which is gold, and which has Vickers hardness of 150 or less and a thickness smaller than that of the coating layer but not larger than 0.002 times the wire diameter.

Chang discloses a bonding wire comprising a coating layer which is gold and is an outermost layer. It would have been obvious to one skilled in the art to coat the bonding wire of Toyofuku et al. with a gold layer as taught by Chang to improve the bonding characteristics of the wire. It would also have been obvious to one skilled in the art to choose suitable Vickers hardness and thickness for the gold coating layer in the modified wire of Toyofuku et al. to meet the specific use of the resulting wire since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chau N. Nguyen whose telephone number is 571-272-1980. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F.F. Gutiérrez can be reached on 571-272-2800 ext 31. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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